

## **MANAGEMENT OF AREAS POLLUTED BY RADIOACTIVES SUBSTANCES: THE UPDATED FRENCH APPROACH**

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In the 90's, French administration developed a series of tools to set up an inventory of potentially polluted sites and to identify places requiring an immediate action. Initially designed for chemical pollutions the tools were adapted to radioactive pollutions in the beginning of 2000.

Considering radioactive pollution, France deals with sites inherited from nuclear researches and development activities and the industry of radium or other radionuclides like tritium. For instance many working places associated with the storied history of Pierre and Marie Curie are still polluted by  $^{226}\text{Ra}$  and progenies. Sites where former NORM and TENORM facilities were operated may also be considered as polluted area especially when residues are left over.

Gradually public services' questions and needs moved from "an inventory of polluted sites and a selection of those requiring immediate actions" to "how to manage the identified sites?"

The French Institute for Radiological Protection and Nuclear Safety (IRSN) was therefore committed by the Ministry of Ecology and the Nuclear Safety Authority (ASN) to establish guidelines on the management of areas polluted by radioactive substances. These guidelines were drafted with the aim to be fully coherent with those already published for other types of pollutants.

The methodology proposed first defines the approach to be followed at the step of site characterization in order to adequately describe radioactive sources as well as transfer and exposure pathways. The current or future use of the site, the existence of environmental resources such as water, protected animals and plants species, also have to be considered from this stage.

Two different situations are distinguished: (1) polluted areas with ongoing use, (2) urban and industrial wasteland or sites at a dismantling and redevelopment stage.

In the first situation, the decision process is based on a comparison between the level of pollution or exposure and threshold values defined in existing general regulations. That may be the content of  $^{238}\text{U}$  in drinking water or the indoor radon activity concentration. When no values are available, assessment of effective dose associated with existing uses is required. On the second case, the decision process entails a comparison between different options for managing the polluted site, taking into account: effective doses, feasibility, short and long term efficiency, as well as waste management and associated costs.

The new guidelines will be illustrated with a real case.